

Guidelines for the Trunk test for Paracanoe Athletes



Information

Please note that the purpose of the pictures is to show the position of the athlete and classifier. The classifier's job is to assess function and not position, the scores may therefore be different during a classification even though the position is similar to what is shown in the manual.

Equipment

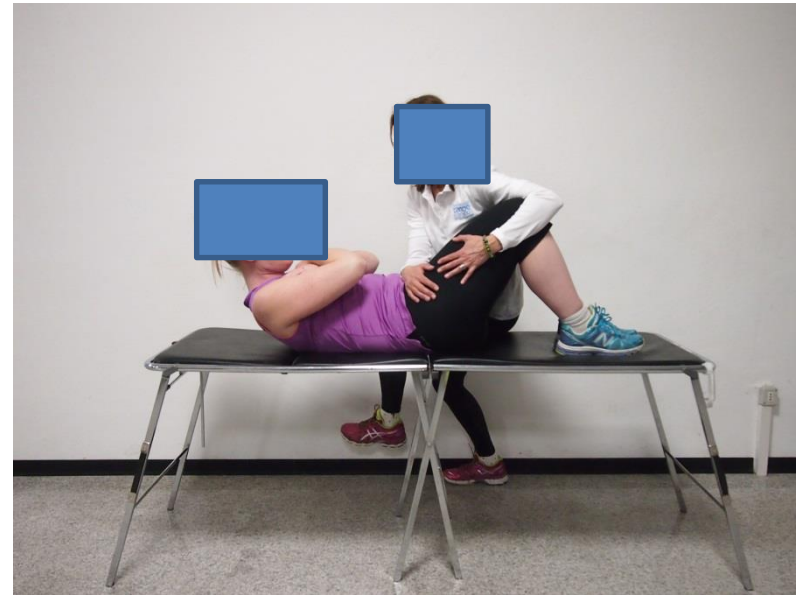
- Treatment bench with adjustable height
- Wobble cushion
- Protocol

Manual Muscle Test (MMT)

- Athlete will perform **seven** trunk muscle tasks
 - trunk flexion
 - trunk rotation to the right (R) and to the left (L)
 - trunk side bending/flexion to the R and L
 - trunk lumbar extension
 - trunk lumbar extension and hip extension
- The tests will be performed on a **0-2** scale.
- Total number of points available for this section = **14**

MMT Trunk flexion Score 2

- **Position of Athlete:** Supine with arms crossed over chest.
- **Position of Classifier:** Standing beside the athlete and stabilize the legs and pelvis. Classifiers should check if the scapulae clear the table during the test.
- **Test:** Athlete flexes trunk through range of motion. A curl-up is emphasized, and trunk is curled until scapulae clear table.
- **Instruction:** “Tuck your chin and lift your head and shoulders to curl up off the table.”
- **Score 2:** Athlete completes range of motion and raises trunk until scapulae are off the table.



MMT Trunk flexion Score 1

- **Position of Athlete:** Supine with arms stretched towards toes.
- **Position of Classifier:** Standing beside the athlete and stabilize the legs and pelvis. Classifiers should check if the scapulae clear or partially clear the table during the test. The hands used for palpation is placed at the midline of the thorax over the linea alba, and one hand is used to palpate the Rectus Abdominus.
- **Test:** Athlete attempts to flex trunk.
- **Instructions:** “Tuck your chin and lift your head and shoulders to curl up off the table.”
- **Score 1:** Athlete completes partial range of motion and the examiner must be able to detect contractile muscle activity.

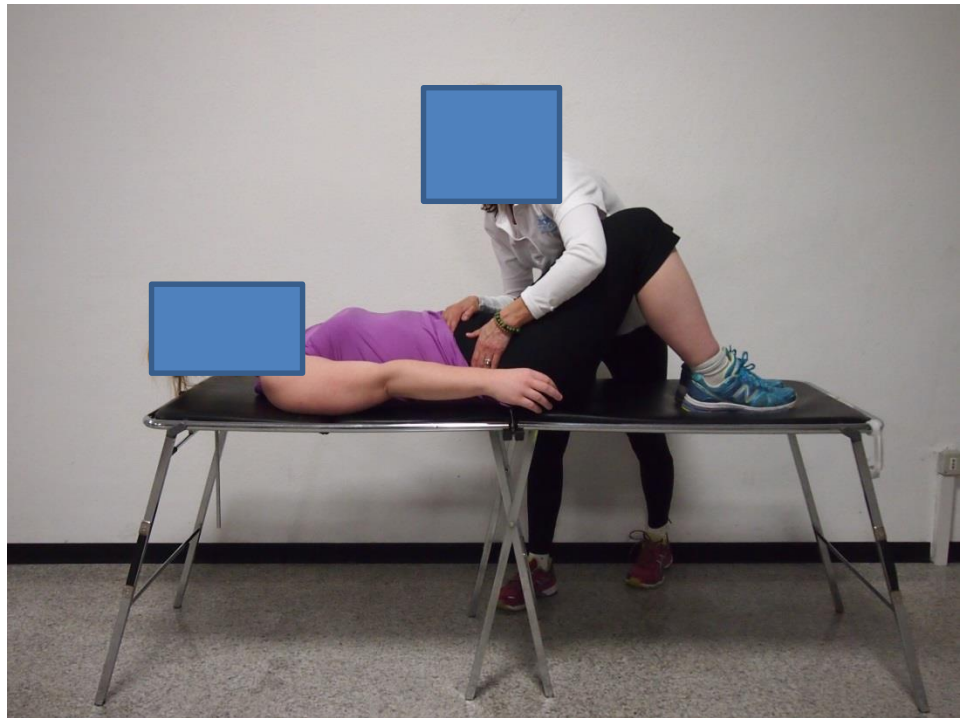


*extra tests can be found in the end of the guideline.

MMT Trunk flexion Score 0

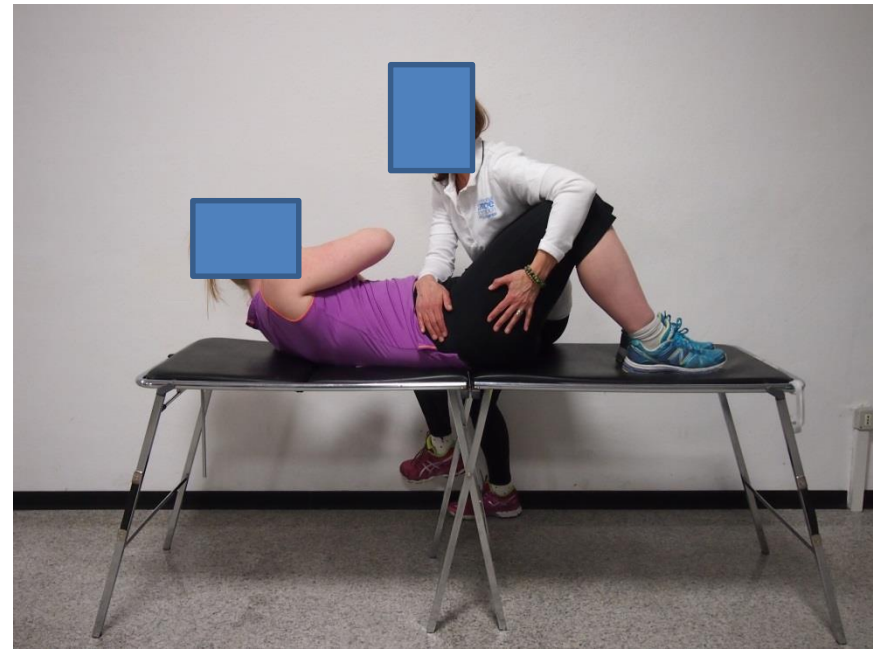
- **Position of Athlete.** Supine with arms stretched towards toes.
- **Position of Classifier:** Standing beside the athlete and stabilize the legs and pelvis. Classifiers should check if the scapulae partially clear the table during the test. The hands used for palpation is placed at the midline of the thorax over the linea alba, and one hand is used to palpate the Rectus Abdominus.
- **Test:** Athlete attempts to flex trunk.
- **Instructions:** “Tuck your chin and lift your head and shoulders to curl up off the table.”
- **Score 0:** The athlete is unable to lift the shoulders from the table, and no or very limited activity is visible or palpable during attempted contraction.

*extra tests can be found in the end of the guideline.



MMT Trunk rotation Score 2

- **Position of Athlete:** Supine with arms crossed over chest.
- **Position of Classifier:** Standing beside the athlete supporting the legs and pelvis. Classifiers should check if the scapulae clears the table during the test.
- **Test:** Athlete flexes trunk and rotates to one side. And then the other.
- **Instruction:** “Lift your head and shoulders from the table, taking your left elbow toward your right knee.” Repeat on opposite side.
- **Score 2:** The inferior angle of the scapula on the opposite side to the rotation clears the table.



MMT Trunk rotation Score 1

- **Position of Athlete:** Supine with arms at sides.
 - **Position of Classifier:** Standing beside the athlete and supporting the legs and pelvis. Classifier palpates the External and Internal Oblique on each side.
 - **Test:** Athlete attempts to raise body and rotate to one side. Repeat on the other side.
 - **Instruction:** “Lift your head and shoulders from the table, taking your left hand towards your right knee.” Repeat on opposite side.
 - **Score 1.** Athlete completes partial range of motion and the classifier must be able to detect contractile activity.
- *extra tests can be found in the end of the guideline.



MMT Trunk rotation Score 0

- **Position of Athlete:** Supine with arms at sides.
 - **Position of Classifier:** Standing beside the athlete and supporting the legs and pelvis. Classifier palpates the External and Internal Oblique on each side.
 - **Test:** Athlete attempts to raise body and rotate to one side. Repeat on the other side.
 - **Instruction:** “Try to lift your head and shoulders from the table, taking your left hand towards your right knee.” Repeat on opposite side.
 - **Score 0:** The athlete is unable to lift the shoulder from the table, and no or very limited activity is visible or palpable during attempted contraction.
- *extra tests can be found in the end of the guideline.



MMT Trunk side flexion Score 2

- **Position of Athlete:** Supine with arms crossed over chest.
- **Position of Classifier:** Sitting at level of athlete's pelvis to provide support. Stabilize the pelvis with body and arm. Place one hand on the ipsilateral shoulder of the athlete.
- **Test:** Athlete laterally bends the trunk. Repeat on the other side.
- **Instruction:** "Push towards my hand by bending your trunk to the side."
- **Score 2:** The athlete can overcome resistance and can bend to the side.



MMT Trunk side flexion Score 1

- **Position of Athlete:** Supine with arms crossed over chest.
- **Position of Classifier:** Sitting at level of athlete's pelvis to provide support. Stabilize the pelvis with the body. With one hand classifier palpates the External Oblique on the ipsilateral side with the hand placed on the lateral part of the trunk between the distal part of the rib cage and the pelvis.
- **Test:** Athlete laterally bends the trunk. Repeat on the other side.
- **Instruction:** "Bend your trunk to the side."
- **Score 1:** Athlete is able to move without resistance and the classifier must be able to detect contractile activity.



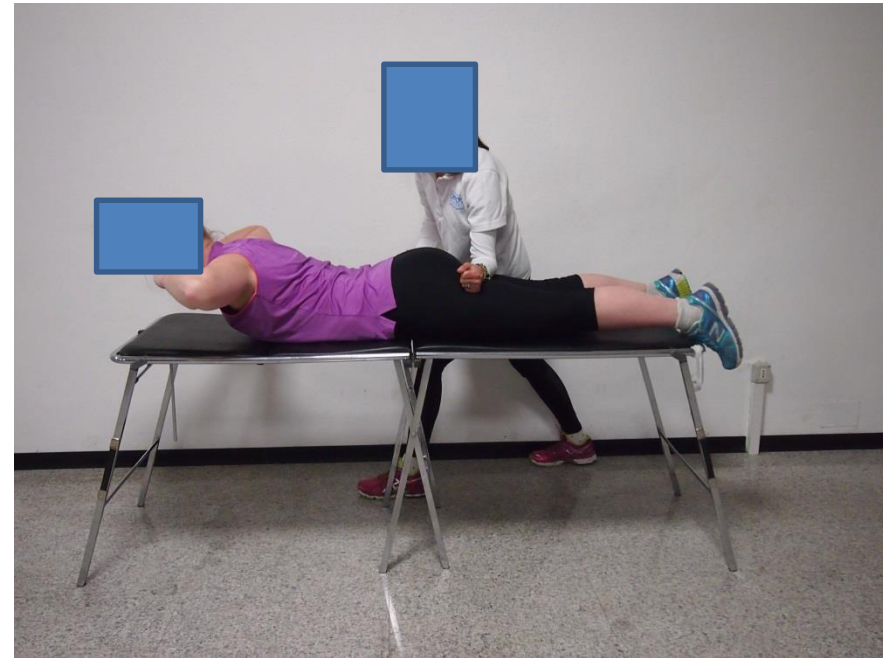
MMT Trunk side flexion Score 0

- **Position of Athlete:** Supine with arms crossed over chest.
- **Position of Classifier:** Sitting at level of athlete's pelvis to provide support. Stabilize the pelvis with the body. With one hand classifier palpates the External Oblique on the ipsilateral side with the hand placed on the lateral part of the trunk between the distal part of the rib cage and the pelvis.
- **Test:** Athlete attempts to laterally bend the trunk. Repeat on the other side.
- **Instruction:** "Try to bend your trunk to the side."
- **Score 0:** The athlete is unable to bend sideways and no or very limited activity is visible or palpable during attempted contraction.



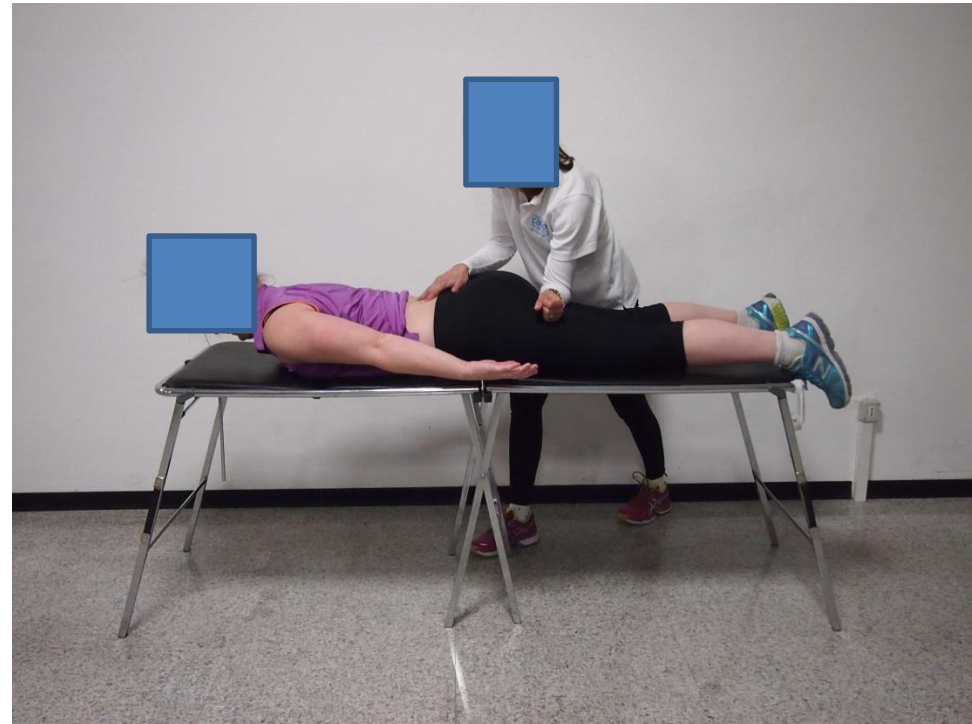
MMT Trunk Lumbar Extension Score 2

- **Position of Athlete:** Prone with hands close to head or by their sides.
- **Position of Classifier:** With hands holding just close to ischeal tuberosities.
- **Test:** Athlete extends the **lumbar** spine until the entire sternum is raised from the table .
- **Instruction:** “Raise your head, shoulders, and chest from the table as high as you can”
- **Score 2:** The athlete can achieve the end position.



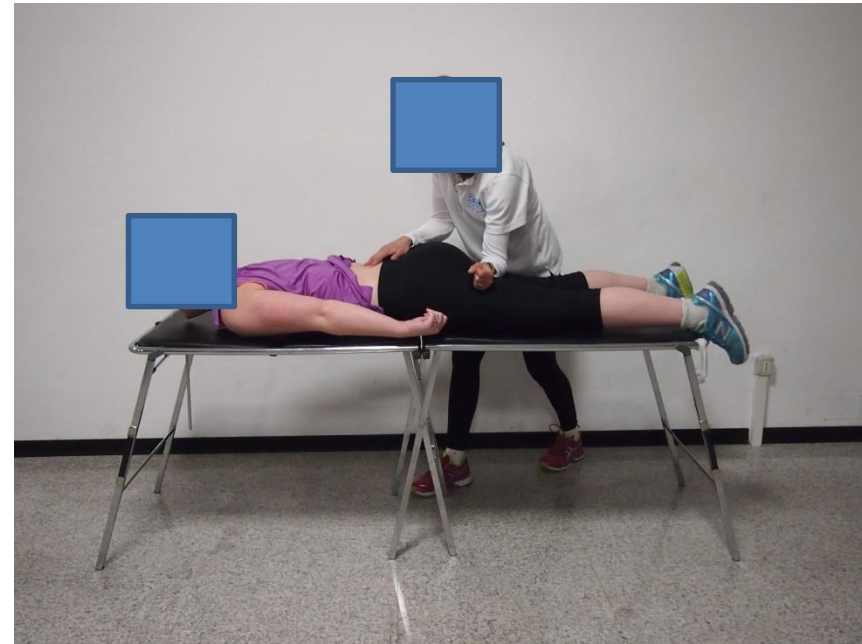
MMT Trunk Lumbar Extension Score 1

- **Position of Athlete:** Prone with their arms placed by their sides.
- **Position of Classifier:** Support high on the thighs. Classifier palpates the Erector Spinae on both sides.
- **Test:** Athlete extends the trunk.
- **Instruction:** “Lift your head and chest as high as possible”.
- **Score 1:** Athlete completes partial range of motion and the classifier must be able to detect contractile activity.



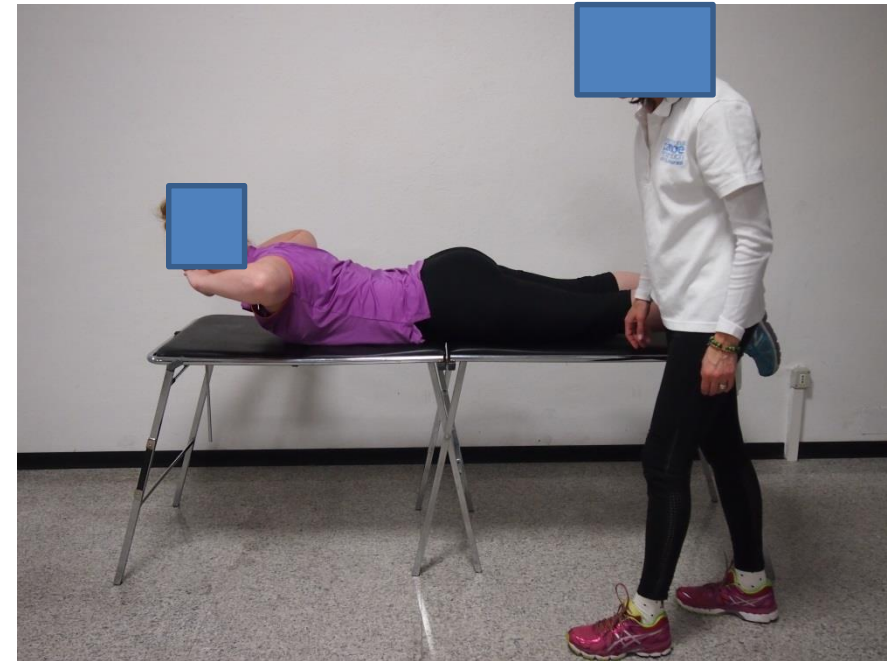
MMT Trunk Lumbar Extension Score 0

- **Position of Athlete:** Prone with their arms placed by their sides.
- **Position of Classifier:** Support high on the thighs. Classifier palpates the Erector Spinae on both sides.
- **Test:** Athlete extend the trunk.
- **Instruction:** “Lift your head and chest as high as possible”.
- **Score 0:** The athlete is unable to lift the trunk off the table and no or very limited activity is visible or palpable during attempted contraction.



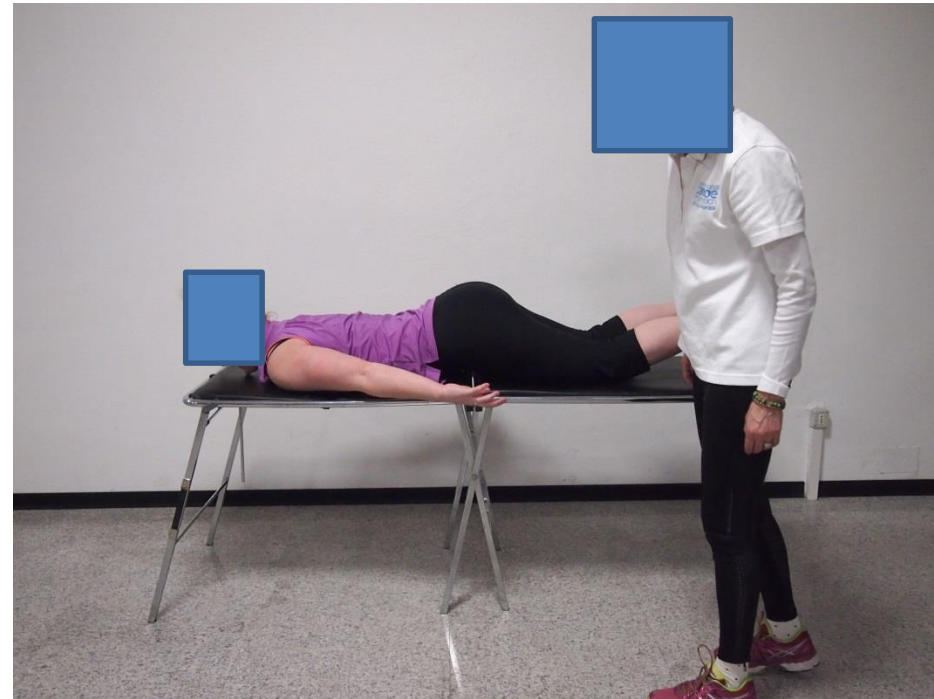
MMT Trunk and hip extension Score 2

- **Position of Athlete:** Prone with their hands placed by the head or by their sides.
- **Position of Classifier:** Standing at the side of the athlete to observe the trunk movement and position of the pelvis.
- **Test:** Athlete extend the trunk.
- **Instruction:** “Lift your head and chest as high as possible”
- **Score 2:** The sternum clears the table, and the pelvis remains flat on the bench.



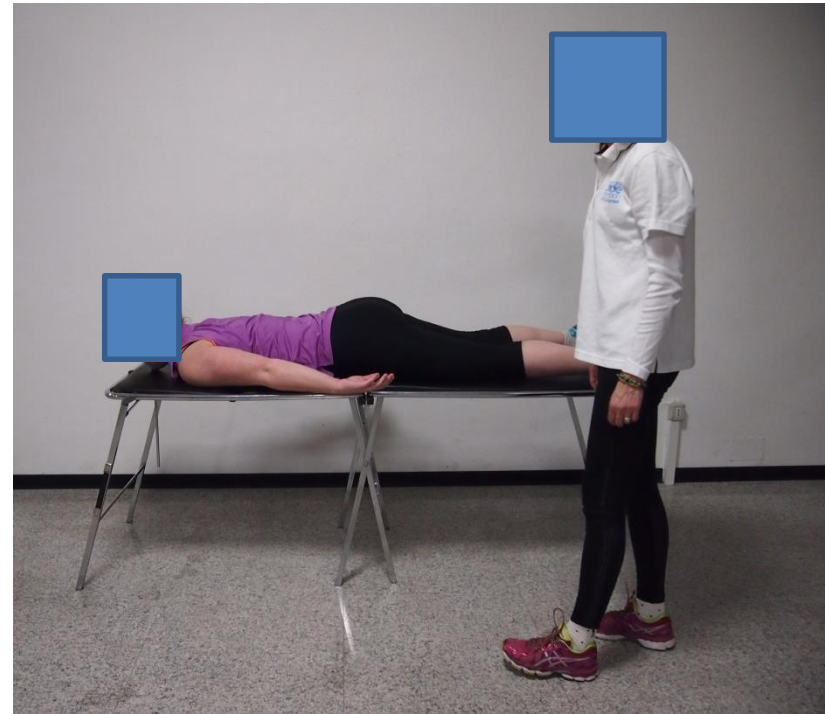
MMT Trunk and hip extension Score 1

- **Position of athlete:** Prone with their arms placed by their sides.
- **Position of Classifier:** standing at the side of the athlete to observe the movement of the trunk and the position of the pelvis
- **Test:** Athlete extend the trunk.
- **Instruction:** “Lift your head and chest as high as possible”
- **Score 1:** Athlete completes partial range of trunk extension. If the hip flexor muscles are stronger than the hip extensor muscles, the athlete’s pelvis will lift from the bench.



MMT Trunk and hip extension Score 0

- **Position of athlete** : Prone with their arms placed by their sides.
- **Position of classifier**: standing at the side of the athlete to observe the movement of the trunk and the position of the pelvis
- **Test**: Athlete extend the trunk.
- **Instruction**: “Lift your head and chest as high as possible”
- **Score 0**: The athlete is unable to lift the trunk of the table and no or very limited activity is visible or palpable during attempted contraction.



Functional Assessment Score

Athletes will be asked to complete functional tasks while sitting. Athletes should look at the classifier during all functional assessment tests. Athletes should not stabilize themselves by locking the legs under the bench.

The examination includes:

- static tasks (sitting upright with arms outstretched in 4 directions), scores a maximum of **10** points
- dynamic tasks (moving trunk through a range of motion), scores a maximum of **12** points
- resistance and perturbation from 6 directions, scores a maximum of **24** points
- resistance and perturbation from 6 directions while athlete is sitting on a wobble cushion, scores a maximum of **24** points

There are a maximum of **70** points for the Functional assessment. These are added to the Manual Muscle Test score for a maximum of **84** points.

Position of classifier



Athlete with above knee amputation might need this type of support

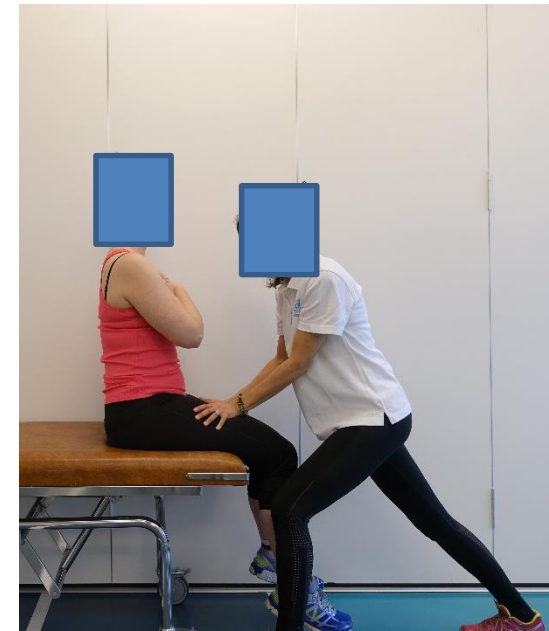


Athlete needing more support

Static test

Upright Sitting

- **Description:** Athlete sits with legs hanging over the edge with feet unsupported. Athlete crosses arms to prevent support. Classifier brings athlete into upright position, one hand on sternal bone and one hand on back, then slowly lets go of support.
- **Instruction:** “Sit up tall.”
- **Evaluation:** Observe sitting position after removing the support:
 - straight/upright
 - flat belly
 - kyphotic/quad/para belly
- **Score 2:** Sits straight upright, without marked kyphosis, and with flat belly for 3 seconds or more.
- **Score 1:** Can only manage upright sitting for less than 3 seconds and compensates with head movement.
- **Score 0:** Sits with marked kyphosis due to a compensation of not having/having limited trunk function or with quad belly.



Static test

Upright Sitting with shoulder flexion/extension

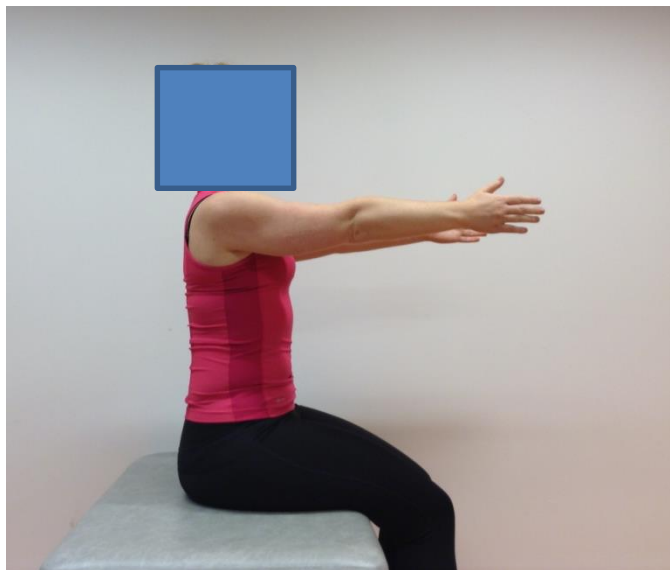
- **Description:** Athlete sitting on the plinth with legs hanging over edge of plinth with the feet unsupported. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth.

Flexion: Athlete is instructed to lift both arms to 90° shoulder flexion, hold for 2 seconds and slowly go back to the initial position.

Extension: Athlete is instructed to lift both arms to about 30° shoulder extension, hold for 2 seconds and slowly go back to the initial position.

- **Evaluation:** Observe movement quality and range standing lateral to the athlete.
- **Score 2:** Athlete performs shoulder **flexion** to at least 90° with a straight upright position.
- **Score 2:** Athlete performs shoulder **extension** to at least 30° with a straight upright trunk position.
- **Score 1:** Athlete attempts to **flex/extend** shoulders to **90°/30°** but can only maintain a straight upright trunk momentarily before compensating by kyphosis or lordosis.
- **Score 0:** Athlete is unable to maintain an upright posture to lift the arms, either into flexion or extension.

Score 2



Shoulder flexion

Score 0



Shoulder extension



Static test

Upright Sitting with abduction

- **Description:** Athlete sitting on the plinth with legs hanging over edge of plinth with the feet unsupported. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth. .
Abduction: Athlete is instructed to lift one arm to 90° shoulder abduction, hold the position for 2 seconds and slowly go back to the initial position. The other arm is crossed over the chest.
- **Evaluation:** Observe movement quality and range standing lateral to the Athlete.
- **Score 2:** Athlete performs shoulder abduction to at least 90° with a straight upright position.
- **Score 1:** Athlete lifts shoulder to 90°, but is unable to maintain upright posture throughout the test without compensation.
- **Score 0:** Athlete is unable to lift the shoulder to 90° and compensates with kyphosis/lordosis. May need support to resume straight position



Dynamic test

Active Trunk Flexion/Extension

- **Description:** Athlete sits on the plinth with legs hanging over the edge, with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth.
- **Evaluation:** Observe movement quality and range standing lateral to the Athlete.
- **Score 2:** Athlete performs trunk flexion to at least 20° line between pelvis and C7 and vertical, and maintains position for 2 seconds before returning to upright position, **and** performs at least 15° trunk extension and maintains position for 2 seconds before returning to upright position.
- **Score 1:** Athlete flexes to less than 20° and extends to less than 15°, and is unable to maintain the position for 2 seconds. May compensate to resume straight position.
- **Score 0:** Athlete cannot flex or extend without compensation by kyphosis/lordosis or cannot resume straight position without support.

Dynamic test

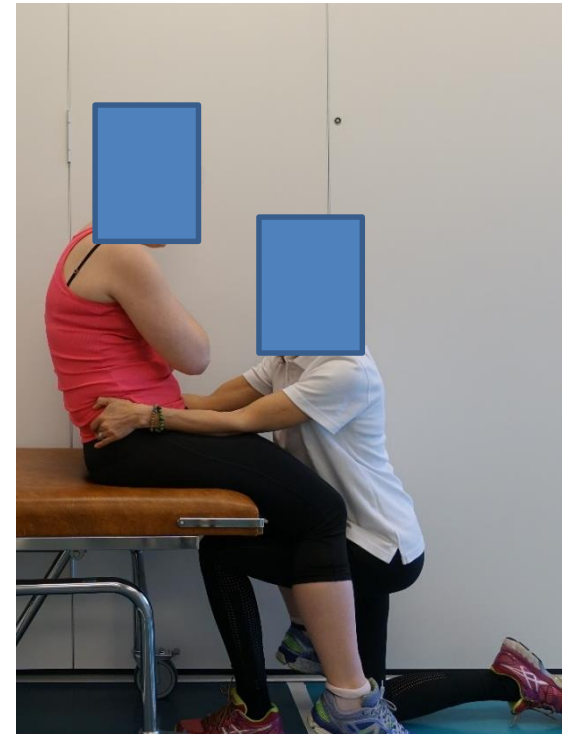
Active Trunk Flexion



Score 2



Score 2



Score 0

Dynamic test

Active Trunk Extension



Score 2



Score 0

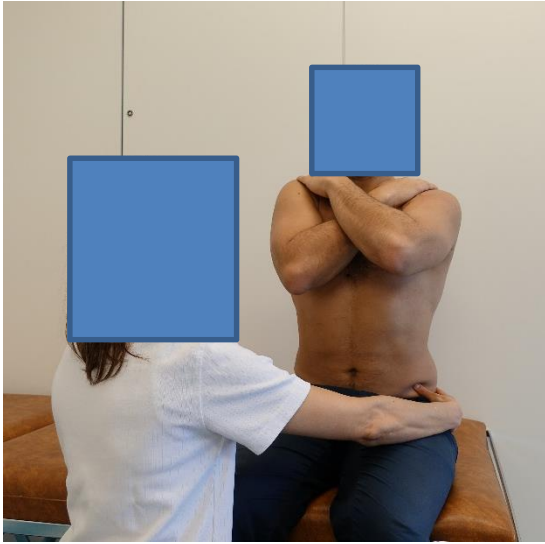
Dynamic test

Active Trunk Rotation

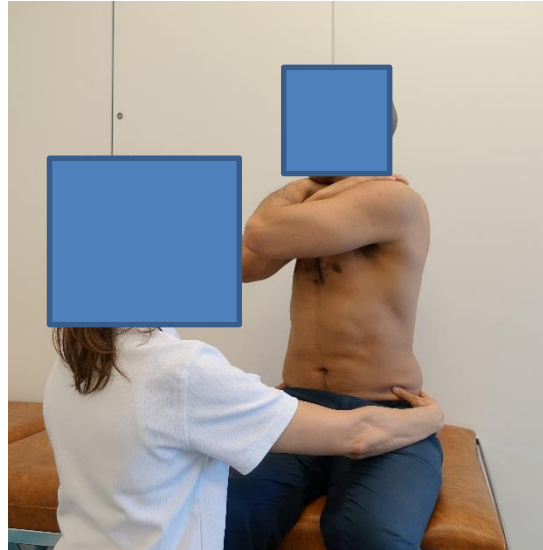
- **Description:** Athlete sits on the plinth with legs hanging over edge, with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth.
- **Evaluation:** Observe movement quality and range standing lateral to the Athlete.
- **Score 2:** Athlete stays in upright position and rotates 20° or more to both sides, measured in straight line between both shoulders and line between ASIS on both sides. Classifier sits in front of athlete to observe if the athlete rotates below the waist and palpate the ASIS to make sure that the trunk rotation also includes rotation of the pelvis.
- **Score 1:** Athlete rotates mainly with the upper trunk less than 20°, or cannot remain upright whilst rotating. Athletes might need pelvis stabilization from the classifier.
- **Score 0:** Athlete does not rotate, or cannot maintain upright position while rotating (e.g. assumes kyphotic posture) even whilst receiving pelvis support.

Dynamic test

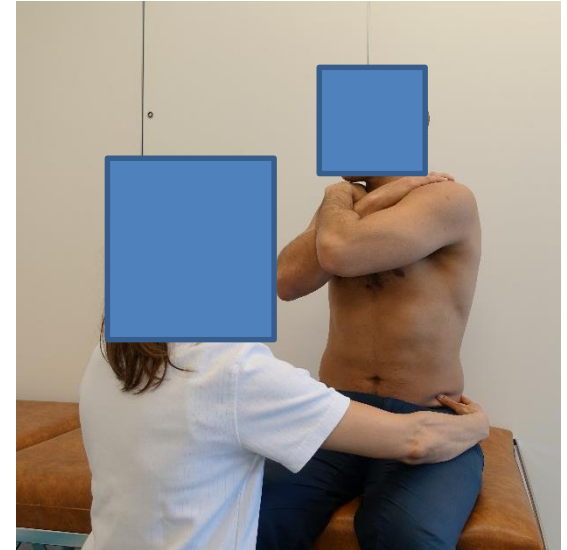
Active Trunk Rotation



Start position



Score 2
Rotation with pelvis
(belly button and ASIS
moves).



Score 1
Rotation without pelvis
(belly button and ASIS
does not move).

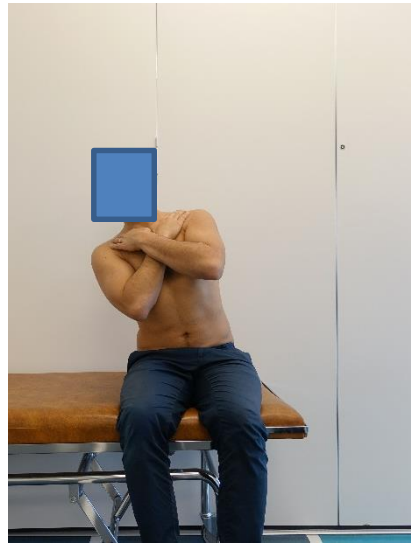
Dynamic test - kayak

Active Trunk Side Flexion

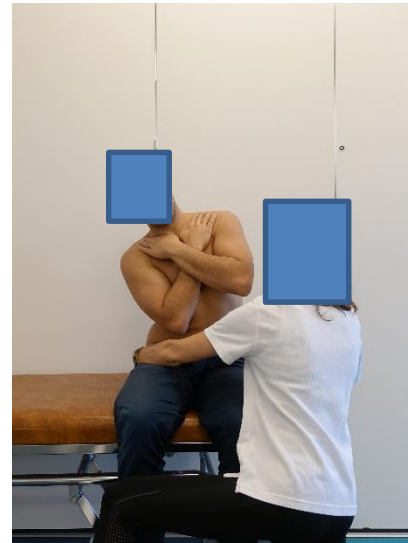
- **Description:** Athlete sits on the plinth with legs hanging over edge, with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth.
- **Evaluation:** Observe movement quality and range standing in front of the athlete.
- **Score 2:** Athlete stays in upright position and performs side flexion at least with suprasternal notch in vertical line above the ASIS to both sides and can maintain this position for 2 seconds before resuming the upright position.
- **Score 1:** Athlete cannot side flex to the level of the suprasternal notch, or can only maintain position momentarily.
- **Score 0:** Athlete cannot side flex, or cannot maintain an upright position while performing side flexion (e.g. kyphotic posture).

Dynamic test - kayak

Active Trunk Side Flexion



Score 2



Score 1

Dynamic test – va'a

Active Trunk Side Shift

- **Description:** Athlete sits on the plinth with legs hanging over edge, with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms. The classifier may need to place his/her hands close to the hips, to fix both legs to the plinth.
- **Evaluation:** Observe movement quality and range standing in front of the athlete.
- **Score 2:** Athlete stays in upright position and performs side shift with suprasternal notch in vertical line above the ASIS to both sides and can maintain this position for 2 seconds before resuming the upright position.
- **Score 1:** Athlete cannot side shift to the level of the suprasternal notch, or can only maintain position momentarily.
- **Score 0:** Athlete cannot side shift, or cannot maintain an upright position while performing side shift (e.g. kyphotic posture).

Dynamic test – va'a

Active Trunk Side Shift



Score 2



Score 1

Trunk Resistance

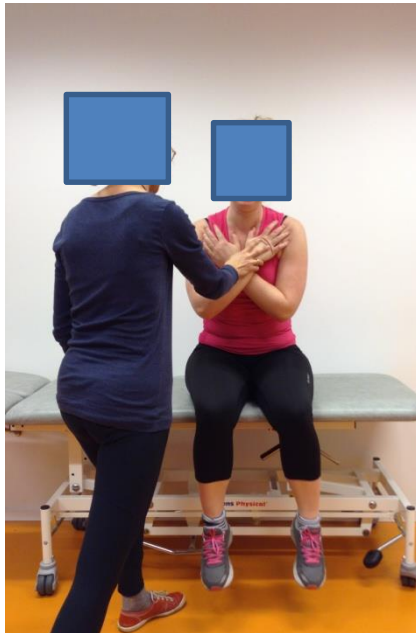
- Trunk Flexion, Trunk Extension, Trunk Rotation, Trunk Side Flexion

- **Description:** Athlete sits on the plinth with legs hanging over the edge, with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms.

Classifier applies prolonged force to the trunk in six directions by placing the hand in six different locations; anterior, over the mid sternum, posterior, over the thoracic spine midway between the superior and inferior angles of the scapula, and right and left rotation, over the frontal aspect of the acromial process, and right and left side flex, over the lateral aspect of the acromial process.

- **Instruction:** “Hold, do not let me push you over!”
- **Evaluation:** Trunk flexion: RA, both sides of umbilicus, Trunk extension: ES, both sides spine, Trunk rotation to the L: OE R and OI L, Trunk rotation to the R: OE L and OI R, Trunk lat. bending to the L: QL R, Trunk lat. bending to the R: QL L.
- **Score 2:** Athlete is able to adequately resist the constant force to the trunk .
- **Score1:** Athlete resists the initial push but is unable to maintain upright posture, or can only resist a very gentle force
- **Score 0:** Athlete is not able to recover from the constant force.

Trunk Resistance



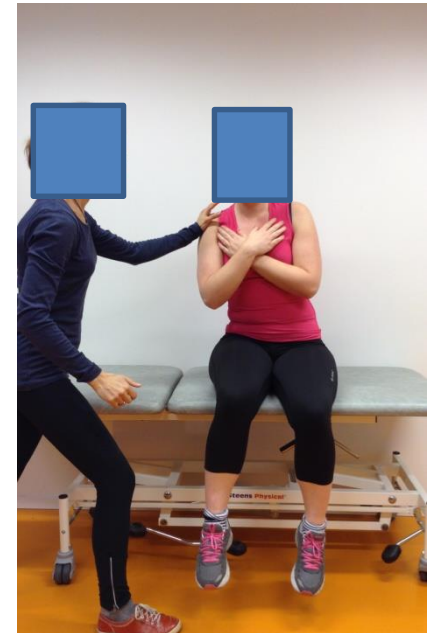
Trunk Flexion



Trunk Extension



Trunk Rotation



Trunk Lateral Bending

Trunk Perturbation

- Trunk Flexion, Trunk Extension, Trunk Rotation, Trunk Side Flexion

- **Description:** Athlete sitting on the plinth with legs hanging over edge of plinth with the feet unsupported. Athlete crosses the arms in front of his/her chest, to prevent support for sitting balance from the arms.

Classifier applies an unexpected/sharp force to the trunk in six directions by placing the hand in six different locations; anterior, over the mid sternum, posterior, over the thoracic spine midway between the superior and inferior angles of the scapula, and right and left rotation, over the frontal aspect of the acromial process, and right and left lateral, over the lateral aspect of the acromial process.

- **Instruction:** “Remain still when I’m trying to push you!”
- **Evaluation:** Trunk flexion: RA, both sides of umbilicus, Trunk extension: ES, both sides spine, Trunk rotation to the L: OE R and OI L, Trunk rotation to the R: OE L and OI R, Trunk lat. bending to the L: QL R, Trunk lat. bending to the R: QL L.
- **Score 2:** Athlete is able to adequately resist the trunk push.
- **Score 1:** Athlete attempts to resist the push, or can only resist a very gentle push.
- **Score 0:** Athlete is not able to apply any resistance to the push.

Trunk Perturbation



Trunk Flexion



Trunk Extension



Trunk Rotation



Trunk Lateral Bending

All Dynamic and Perturbation tasks will be performed on the wobble cushion on a 3 graded scale.

Succeed = 2, In doubt = 1, Clearly fails = 0

Upright sitting



Trunk Resistance



Trunk Perturbation



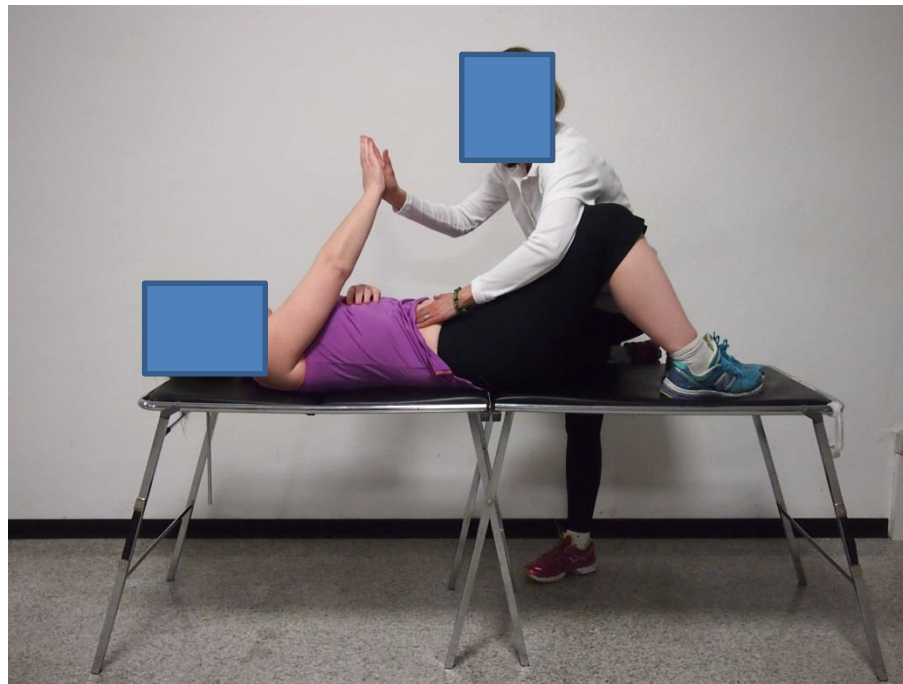
EXTRA TESTS – trunk flexion

- Trunk flexion between 0 and 1 - raise arms with shoulder flexion in 90° and elbows extended and push against classifier's arms. Classifier palpates if there is activity in the Rectus Abdominis.



EXTRA TEST – trunk rotation

- Trunk rotation between 0 and 1 - raise arm with shoulder flexion in 90° and elbows extended and push against classifier's arms. Classifier palpates External Oblique.



Trunk test guidelines for Paracanoe

EXTRA TEST – Trunk extension

- Trunk extension between 0 and 1 - athlete lifts head and classifier provides resistance to neck extension and palpates Erector Spinae to confirm activation in muscles. To further confirm if there is activity, ask athlete to extend shoulders and palpate erector spinae and latissimus dorsi to feel for contraction. Watch for lifting of the pelvis as this indicates some active hip flexors.

